COMMON USW PICTURE

**Presentation for the
NDIA Interoperability Conference**
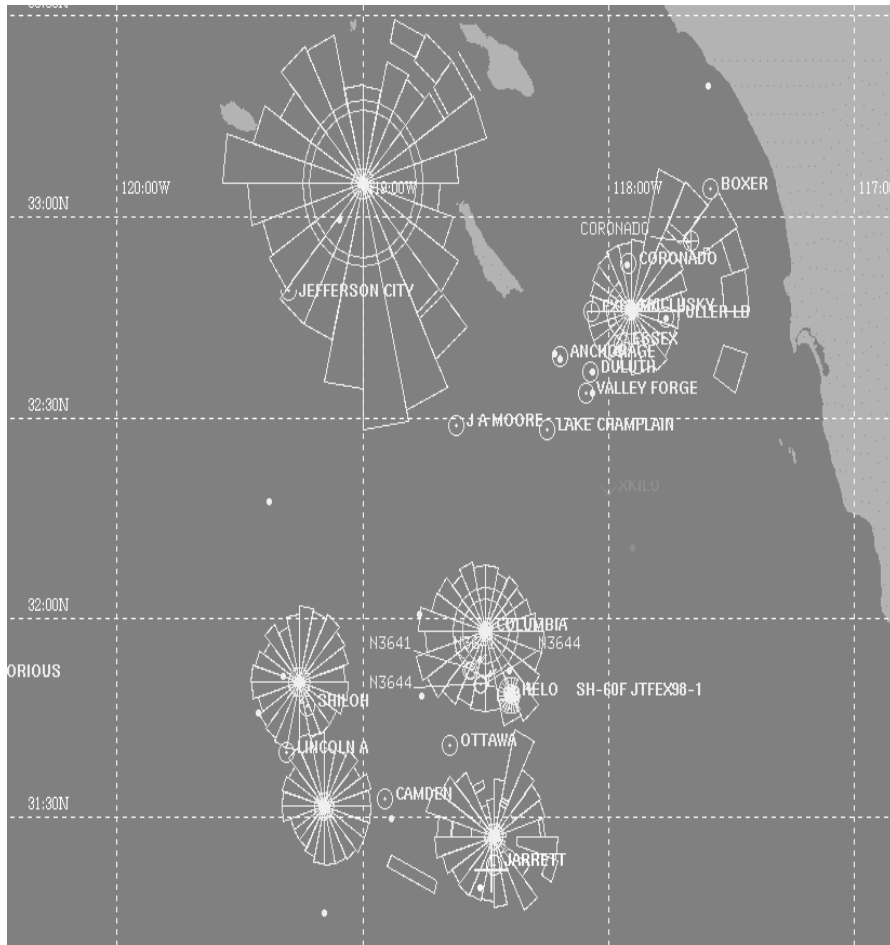
30 May 2001

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"COMMON UNDERSEA PICTURE"
DIFFERENT PERSPECTIVES…SAME "REAL" WATERSPACE

2-D AND…
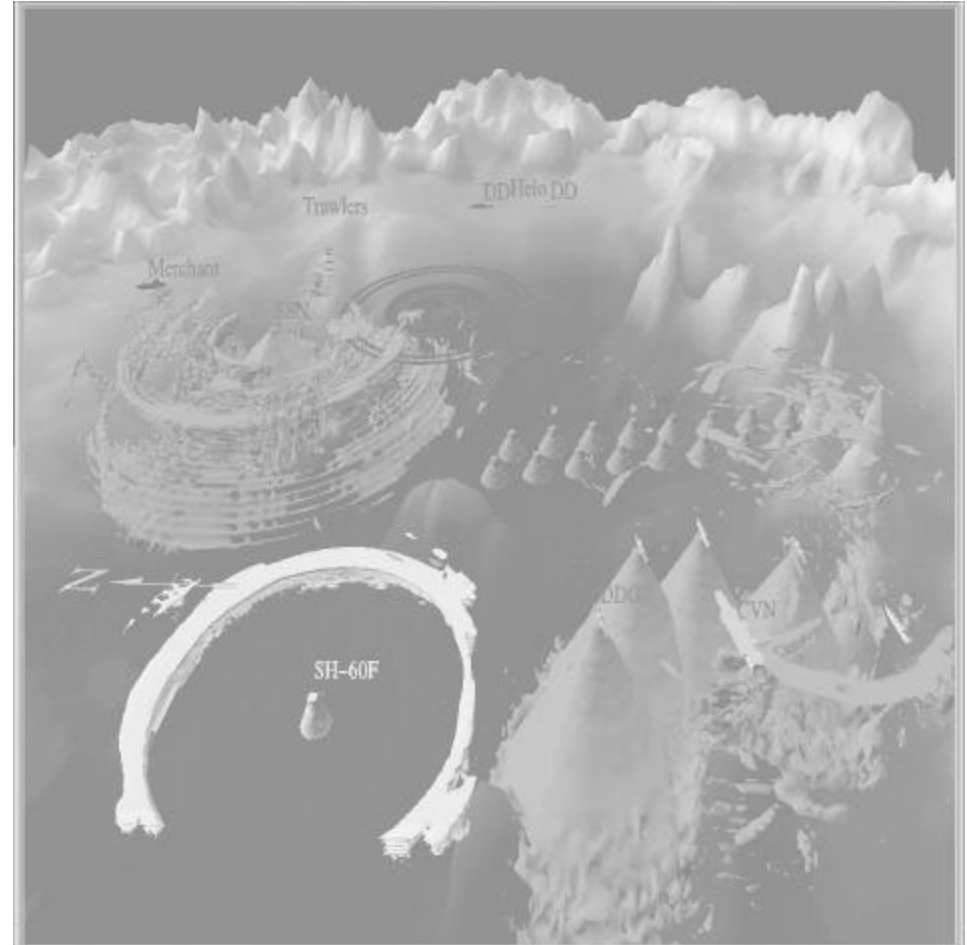
…3-D

What is the CUP Vision?

- **Provide Fleet with capability to plan and conduct USW operations with full knowledge to:**

  - Align sensors to exploit environment

  - Allocate resources and optimize operations

  - Assess risks and vulnerability

  - Manage waterspace

- **Provide this as a software application to Navy C4I systems**

Forging a Community Consensus

ASW Modeling Summit (Aug 00)

- N77 as Lead Resource Sponsor
- Common, Cross-Platform Requirements & Integrated Resources

N77 Precision Environmental Data Study

- Key Data, Data Specs and Models for Best Predictions by Region

Common Undersea Picture Summit (16-17 Nov 00)

ASW Requirements Capture (15-16 Feb 01)

AUSWC- Near Term Demo of an initial USW NCW Architecture

ASW Modeling Summit

Ambient Noise (L_N) (RL)

Signatures (L_S) (TS)

Ocean Water Mass

Bottom

Surface

Acoustic Propagation (TL)

Sensor Performance Prediction ?

ASW Tactical Decision Aids

Beam Forming (N_{DI})

Signal Processing (N_{RD})
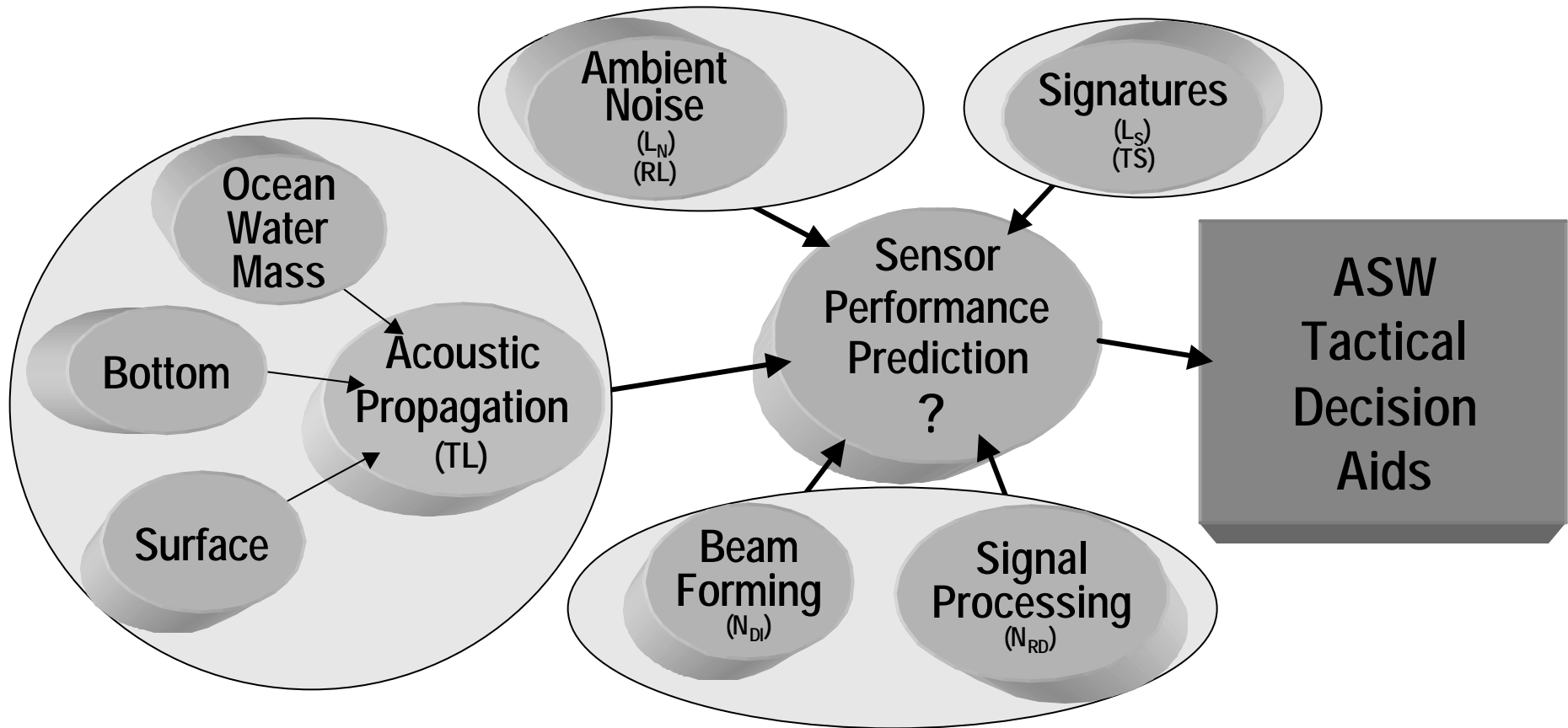
No Established Data Specs/ Data Management "Owner" and No One Owns the "Final Product" to the User

VALIDATION of TDAs essential!

N77 Precision Environmental Data Study

8. Barents
9. Norwegian Sea

4. Yellow Sea

1. SOCAL

10. Adriatic
11. Mediterranean

2. Gulf of Oman
3. Straits of Hormuz

7. Wonsan Korea

5. East China Sea
6. Sea of Japan
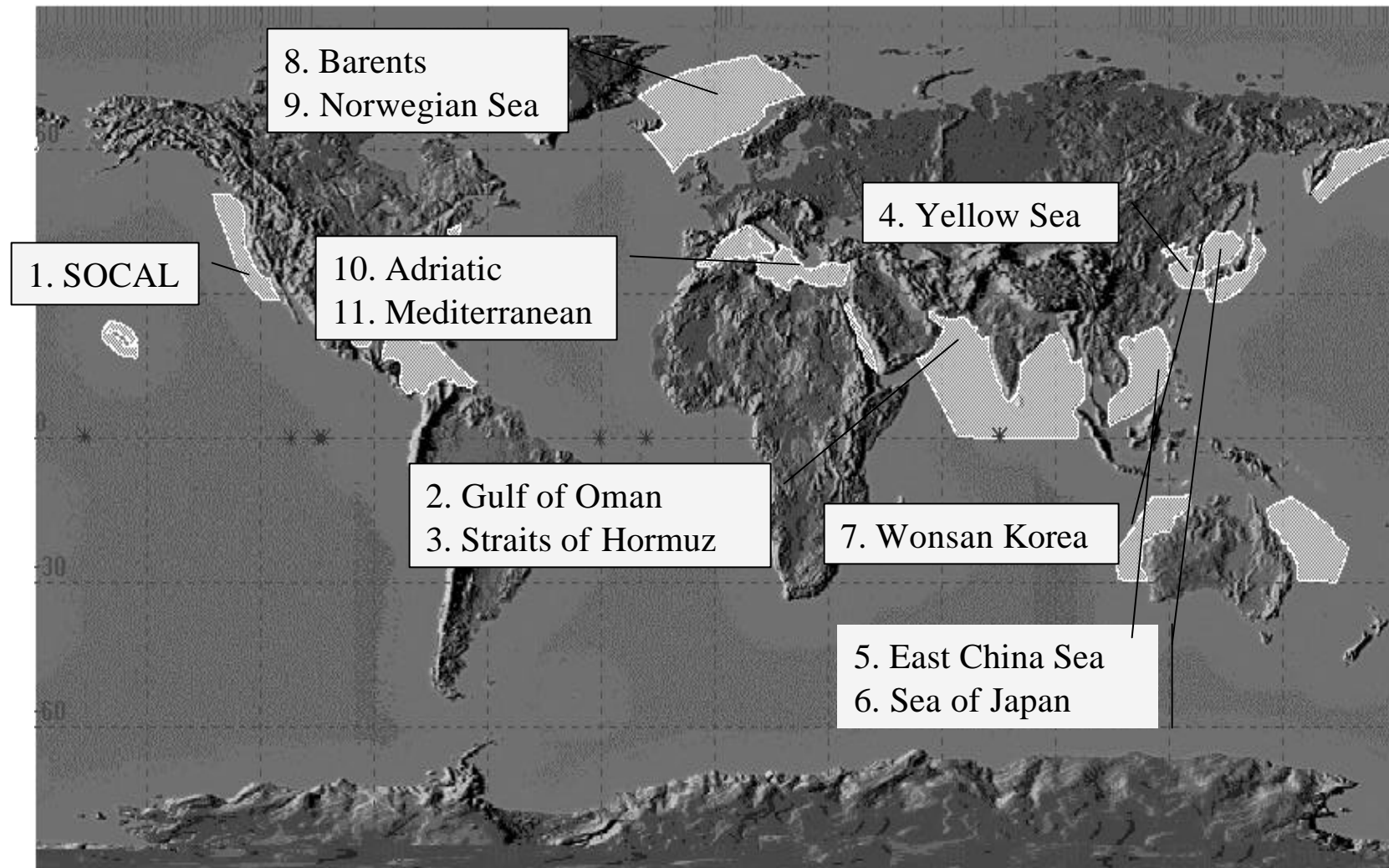
Goal: Define key data, data specs, and models for best predictions by region

Common Undersea Picture Summit

- **Hosted by N74, PEO MUW, NAVSEA 93, and SPAWAR PD-18**

- **Over 110 participants represented all levels of USW (MIW + ASW) Community, including key Fleet Reps**

- **Flag consensus to:**
  - **Build upon past efforts**
  - **Focus on USW at Sea Combat Cdr/MIW Cdr level**
  - **Develop POAM, using "open & inclusive" process**
  - **Link to Navy C4I infrastructure**

Advanced USW Concept (AUSWC)

Goals:

- **Field/ Demonstrate a Network-Centric USW Theater Combat System**
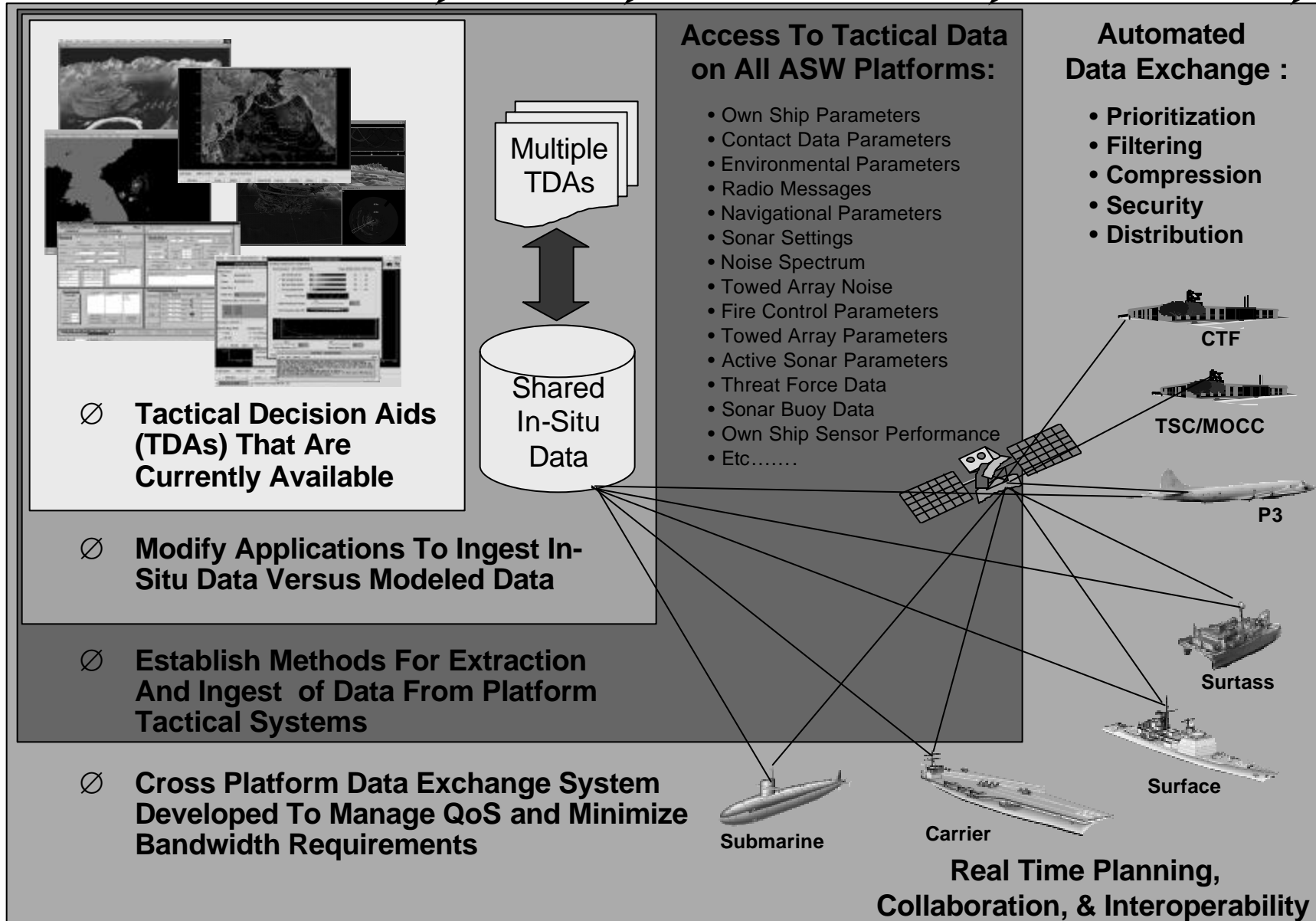 - **Common Picture**
    - * **Common Environmental Picture**
    - * **Common Decision Aids / Models**
    - * **Common Communications / Database services**
  - **Collaborative Planning Capability**
  - **Vulnerability Assessment**
- **Common Framework for Future S&T Initiatives**
- **Cross-Platform USW Community Participation**

Incremental Steps to Achieve Network Centric Capability

Start

Network Centric

Access To Tactical Data on All ASW Platforms:

- Own Ship Parameters
- Contact Data Parameters
- Environmental Parameters
- Radio Messages
- Navigational Parameters
- Sonar Settings
- Noise Spectrum
- Towed Array Noise
- Fire Control Parameters
- Towed Array Parameters
- Active Sonar Parameters
- Threat Force Data
- Sonar Buoy Data
- Own Ship Sensor Performance
- Etc.......

Automated Data Exchange :

- **Prioritization**
- **Filtering**
- **Compression**
- **Security**
- **Distribution**

Multiple TDAs

Shared In-Situ Data

Ø **Tactical Decision Aids (TDAs) That Are Currently Available**

Ø **Modify Applications To Ingest In-Situ Data Versus Modeled Data**

Ø **Establish Methods For Extraction And Ingest of Data From Platform Tactical Systems**

Ø **Cross Platform Data Exchange System Developed To Manage QoS and Minimize Bandwidth Requirements**

CTF

TSC/MOCC

P3

Surtass

Surface

Submarine

Carrier

Real Time Planning, Collaboration, & Interoperability

AUSWC Integration/Test Schedule

```
  2/8/01              2/9/01      2/18/01      3/22/01    5/11/01         5/15/01
┌─────────────┐    ┌─────────────┐          ┌─────────────┐          ┌─────────────┐
│   Update    │    │ DDG/SSN/CV  │          │ DDG/CVN/P-3/│          │   Update    │
│  Baseline   │──▶ │  Pierside   │──▶       │SSN/MOCC/CTF12│──▶      │  Baseline   │──▶
│ Build 2 Rev 1│   │Technical Test│         │Technical Testing│       │ Build 2 Rev 2│
└─────────────┘    └─────────────┘          │  "Pierside"  │         └─────────────┘
                                             └─────────────┘
```

◀─────────────────────── **COMPLETE** ───────────────────────▶

```
  5/23-31/01          6/4-8/01                7/15/01                  8/01
┌─────────────┐    ┌─────────────┐          ┌─────────────┐          ┌─────────────┐
│   FLTEX     │    │    IUSS     │          │   Update    │          │   ASWEX     │
│ (Technical) │──▶ │Install/Testing│──▶     │  Baseline   │──▶       │   Hawaii    │
│             │    │             │          │ Build 2 Rev 3│         │   Oparea    │
└─────────────┘    └─────────────┘          └─────────────┘          └─────────────┘
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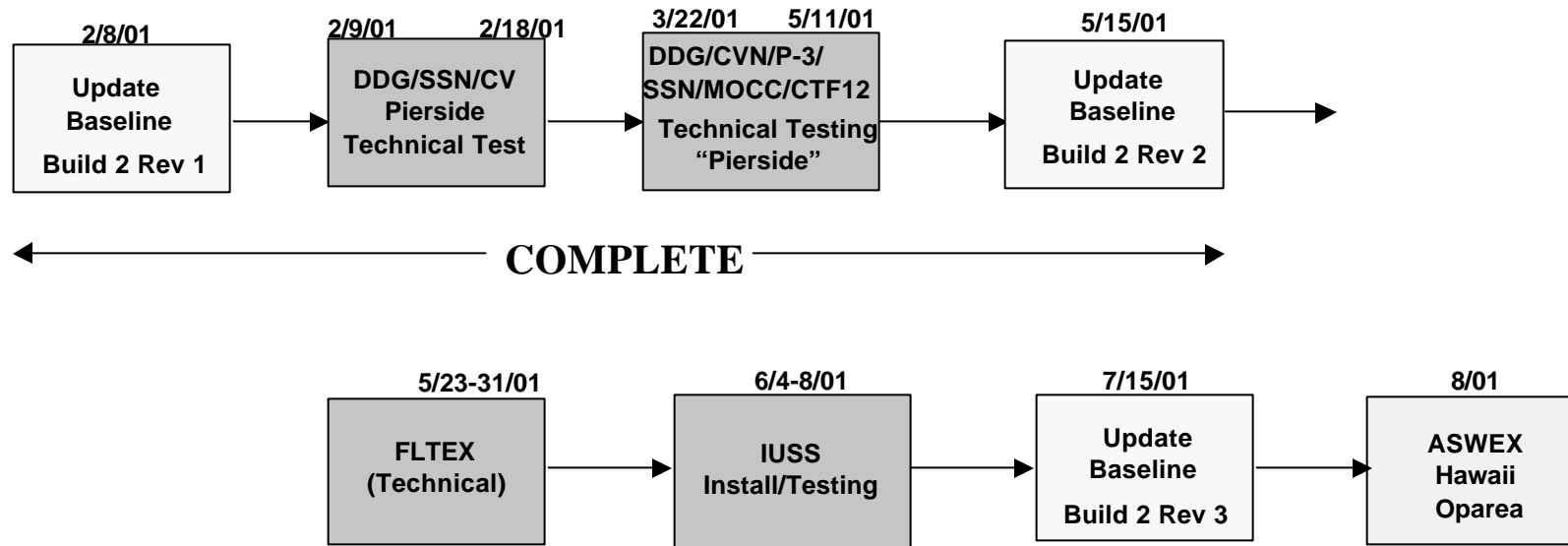
☐ Software Delivery

■ Technical Test

☐ Operational Demo

Integration Lessons Learned

- **Adopt an Open Source Policy**
  - **Interface Source Code Should be Considered Absolute Minimum**

- **Integration of Closed Architecture-Based Applications is Difficult and Costly**

- **DII-COE compliancy (even to level 6) does not guarantee interoperability**

Communications

- **Existing Communications (Network and Bandwidth Management) Methods are a Challenge**
  - Allocation vice Management of Bandwidth

- **Management of Network Bandwidth by Allocation Creates Conflicts and Further Reduces Available Pipes**

- **Advertised Platform "Pipes" of 32K Actually Provide Less Than 9K Within the GENSER Enclave**
  - No Consistent Bandwidth at any Workstation
  - An Image Download on any GENSER Workstation Effectively Reduces Your Bandwidth to 0

Data Management Services Required

Summary

- **Challenge is to provide near term tools for today's warfighters, while working long term solution**

- **Consolidating USW requirements to support program initiation**

- **USW Community committed to cross-platform cross-mission area development & implementation**

Questions?